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**BALANCING SCIENCE OBJECTIVES AND OPERATIONAL CONSTRAINTS:
A MISSION PLANNER'S CHALLENGE**

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Abstract

The Air Force Miniature Sensor Technology Integration (MSTI-3) satellite's primary mission is to characterize Earth's atmospheric background clutter. MSTI-3 will use three cameras for data collection: a mid-wave infrared imager (MWIR), a short-wave infrared imager (SWIR), and a visible imaging spectrometer (VIS).

Mission science objectives call for the collection of over 2 million images within the one year mission life. In addition, operational constraints limit camera usage to four operations of twenty minutes per day, with no more than 10,000 data and calibration images collected per day. To balance the operational constraints and science objectives, the Mission Planning Team has designed a planning process to create event schedules and sensor operations timelines. Each set of constraints, including spacecraft performance capabilities, the camera filters, the geographical regions and the spacecraft-Sun-Earth geometries of interest, and remote tracking station deconflictions has been accounted for in this methodology.

To aid in this process, the Mission Planning Team is building a series of tools from Commercial Off-the-Shelf software. These include the Mission Manifest which builds a daily schedule of events, and the MSTI Scene Simulator which helps build geometrically correct scans. These tools provide an efficient, responsive, and highly flexible architecture that maximizes data collection while minimizing mission planning time.

